Asarco File

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To Linda Jacobson/ENF/R8/USEPA/US@EPA
cc Richard Kinch/DC/USEPA/US@EPA, Shahid Mahmud/DC/USEPA/US@EPA
bcc
Subject Re: Selenium Sources in a Lead Smelter

At your request, here is what I found about selenium contamination at lead smelters:

1. Most lead smelters also cause selenium and arsenic contamination since both metals are often found in lead/zinc ores. There is evidence of selenium contamination at a Pasminco lead/zinc smelter in Australia see:

http://www1.hnehealth.nsw.gov.au/hneph/EHM/Smelters.htm.

2. Another good study of selenium contamination at an Australian lead smelter is noted at:

http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V78-44YF6N7-1&_user=14684&_coverDate=07%2F03%2F2002&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_acct=C000001678&_version=1&_urlVersion=0&_userid=14684&md5=3c64ca5995cfeb1433d7c4df1d477b61

3. It is apparent in the literature that older waste water systems at lead smelters concentrated selenium. If waste water treatment solids were then dumped that could be the source of selenium. Selenium also would be emitted along with lead, cadmium, and arsenic so a down wind plume could have existed that in turn could be another source of selenium.

4. Many lead smelters produce a specialty lead alloy composed of lead, antimony and selenium. This alloy usually contains roughly 0.030 percent selenium. When producing this alloy air emissions and waste water would contain a waste selenium content. see market spec at :

http://pagrik.com/lead-alloys.html

5. Some lead ores contain selenium. there was a process to remove selenium at smelters. The following describes the selenium removal process in Australia. It may have been used in the US.

Several of the lead concentrates refined in Australia contain selenium, which accumulates in the electrostatic mist precipitator dust. Selenium is removed as dust and fume from the hot gas precipitators. The dust is heated with strong sulfuric acid and the selenium is extracted as selenium dioxide fume. This fume is then scrubbed with water to produce selenium acid, and crude selenium is recovered by precipitation.

6. Be aware that copper smelters as well as lead smelters also used to produce a bismuth selenium and arsenic selenium as by-products. You need to check and see if East Helena produced this stuff. If they did -they also may be the source of the selenium plume since both products produce both a liquid and solid waste with selenium in it.

7. A good health assessment of a lead smelter-the US Smelter in East Chicago, Indiana was assessed by ATSDR and found significant selenium contamination in lead slags and bag house dusts. Take a look at:

http://www.atsdr.cdc.gov/HAC/PHA/uss/uss_p2.html